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Broadcast Signal Lab

Comments to
Notice of Proposed Rulemaking

GUIDELINES FOR EVALUATING THE ENVIRONMENTAL EFFECTS OF RADIOFREQUENCY RADIATION

ET Docket no. 93-62

Introduction

Broadcast Signal Lab is in the business of providing measurement services to New England area broadcasters, cellular operators, and communications facility managers. These services help our clients keep their facilities in compliance with technical regulations. We have been measuring and calculating radio frequency exposure conditions since the time that the FCC and the Commonwealth of Massachusetts adopted guidelines for Maximum Permissible Exposure. We also make presentations to the public at meetings and hearings. Hence, the adoption of new regulations affects our business and that of our clients.

Summary Observations

Managing the environmental effects of RF facilities is an important responsibility.

Standards are set to permit the maximum reasonable use of the resources (the spectrum) while assuring the well-being of the community and the individual.

Standards makers attempt to define limits to protect the Public Health. By "Public Health" we mean to imply research-based risk assessment.

The public is concerned with limits to assure the Public Safety. By "Public Safety" we mean to imply a perception of risk which is naturally based on more emotional measures than scientific.

The best science and the most intricate risk assessment are worthless if the resulting standard can't engender public confidence.

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An effective standard, then, would be:

Scientifically derived
Reasonably conservative
Realistic to implement
As small a burden as possible
Believable

The strongest body of science available stands behind the proposed standard.

The standard is conservatively derived.

It is not entirely realistic to implement.

It is more burdensome than necessary.

It will only compound the fears and misperceptions of the public.

Discussion

For the sake of brevity, we will address the last three issues above, because they concern us about the effectiveness of the proposed standard. This discussion will address various questions raised in the Notice, and point to the issues of Implementation, burden, and believability.

Controlled vs Uncontrolled Environments

In Massachusetts, we have been dealing with "public" vs "occupational" exposure limits similar to those proposed. Generally, there has been no significant burden to broadcasters with respect to controlling access to areas above the public exposure limits. A small number of AM stations had to replace or improve their fencing to enclose the maximum public exposure contour. Operators of roof-mounted transmission equipment had to be sure access was well-secured and marked, and that other tradespeople were given adequate reinforcement of the roof-access policies.

The complications we have encountered have come in environments where there is distributed responsibility and environments where non-technical employees have access or passage.

By "distributed responsibility" we mean that the owner of the RF apparatus may be a tenant on a structure owned by a non-technical enterprise and the situation becomes complicated by the presence of a tradesperson hired by another tenant.

With respect to non-technical personnel, it is sensible to choose the uncontrolled environment limits (paragraph 13) "where there is any question of possible exposure of the general public (which might include the non-technical employee)..." The difficulty in interpretation occurs when the environment is one with distributed responsibility.

The RF generator, by virtue of his license, is responsible for the safe operation of his facility. There is no practical incentive for any others to cooperate with the RF generator as long as the burden is only on his license. This places the RF generator in potentially no-win situations unless he owns the property on which he is generating RF.

Clear guidelines must be set on what constitutes reasonable exercise of control and reasonable notification to other parties. The phrase "...where there is any question of possible exposure..." could be interpreted broadly to include the vandal who uses extreme measures to penetrate a well-marked security fence or the landscaping contractor whose employee climbs a well-marked high fence to spread some pea stone around a live AM tower. Without a definition of the Commission's expectations for control, all environments could end up in the uncontrolled category.

Categorical Exclusions

Categorical exclusions presumably exist to reduce the burden of demonstrating compliance in situations where there is inherently low risk of exceeding exposure limits. We have assessed multiple user facilities where some users are categorically excluded and others not. The exempt users are under no incentive to cooperate with those who must show that the aggregate of all RF energy at the facility meets the standards. We feel the burden of compliance must be shared among all users of the spectrum, saving exclusions for narrowly-defined devices, under specifically implemented and controlled circumstances.

Induced and Contact Currents

The management of induced and contact currents has become an issue because of the research considered by the IEEE standards committee. Body currents become less of an issue as frequency rises. The choice of 100MHz, as we understand it, includes a substantial safety margin above the frequencies where effects of concern have been demonstrated.

The 100 MHz cutoff frequency was chosen, in a large part, because the human species has ten fingers. Because 100 MHz is a round figure, it was chosen without regard to practical considerations of implementation.

The 100 MHz cutoff for required current measurements is not a threshold. It was arbitrarily chosen because it is well above the frequencies of concern.

The standard is saying that a station at 100.1 MHz has no reason to be concerned with body current assessment. This is a conservatively derived conclusion on the part of the standards committee. There is no reason to add more conservativism to the already conservative cutoff by raising the frequency. The only reason to extend the limit above 100 MHz would be to force additional spectrum users to bear the same burden as those just below 100 MHz.

The standard is saying that a station at 99.9 MHz is below the (arbitrary) threshold and must have body current measurements. Since we know 100.1 MHz is, by the committee's conclusion, safe from current hazards, and we know that the 100 MHz cutoff is an arbitrary convenience, and we know that the body current research does not does not show a single frequency threshold, we can conclude that 99.9 Mhz is as safe from body current concerns as 100.1 MHz.

Because the cutoff is chosen as a convenience, why not set one at a frequency far less critical to its impact on regulation, implementation, and enforcement? Say, below the FM Broadcast Band. Better, below Channel 6. Better yet, all the way down to Channel 2. It is clear that some change in the cutoff frequency could occur without affecting safety.

If a simple change in the arbitrary cutoff of 100 MHz is not palatable, perhaps the VHF band, which is in effect the safety band of the body current standard, could be presented with an alternative to body current requirements.

Consider that VHF broadcast facilities, which are of relatively high power, typically transmit from towers and typically use antennas with some gain. The question of body currents will generally only apply to workers on the towers near the antennas.

We suggest that between 30 MHz and 100 MHz a standard for presumptive compliance be established. For instance, if the exposure conditions on the ground meet uncontrolled environment standards, and a tower climber has clear limits set for controlled power density exposure, we might presume the body current standard would be met. Of course, with a little study, other conditions and limits might apply.

In addition to the unusual burden of body current analysis, we are concerned about its practicality. Hammett and Edison have spoken well about the inconsistencies of current measurements as presented in the standards. We would underscore the impracticality of taking measurements of a variety of induction and contact geometries and body types on a tower, roof, or in other facilities.

We would also point out that equivalent power density measurements can be made while keeping the measurer on the safe side of the Maximum Permissable Exposure contour. In contrast, measuring body currents requires using a real body, in all practicality, placing the measurer at risk.

There is nothing more counterproductive than having someone go through the motions of measuring something extra just to meet a requirement. We are concerned that the implementation of this body current standard is not demonstrably practical and would result in additional burdens on many users of the RF spectrum.

Believability

This rulemaking has not asked about the effect of public sentiment on the usefulness of a standard. The more complicated, the more exception-oriented, the more arcane a standard is, the less good it will do in assuring the public that they are getting a fair deal from their regulators and businesses. The unsettling fact for any citizen is that the FCC adopted a standard in the 1980's, and now we are in the process of adopting a more conservative one. Are we being too cavalier with the public safety? We have been confronted with questions like this.

Fortunately, in Massachusetts we have had regulations similar to the presently proposed standards. We know that the proposed standard is well-considered and well justified, and that the change to regulating controlled and uncontrolled environments is relatively minor. We hope all who are involved will begin to recognize the importance of public perception and confidence in future revisions. The standards should be as simple and as elegant as possible.

Respectfully submitted,

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